

Plotting and Experimental Design HW

**Print** this out and handwrite your answers. **Typed answers will not be accepted!**

**You must answer in FULL SENTENCES.**  
**Incorporate the question within the answer.**

A physicist watches a golf ball, dropped from rest, bounce off a hard floor from various heights. She wasn't surprised to see that the ball never returned to the height from which it was dropped.

1. Using the conservation of energy, give two reasons why the golf ball never returns to the height from which it was dropped. Provide specific examples. **(10 pts)**

[Watch Work-Energy Relationship Video](#) | [Notes](#) |

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2. The scientist watching the golf ball bounce off the floor has a hunch that there is a mathematical relationship between the drop height and the bounce height. She reasoned that if she could uncover this relationship, she could predict any bounce height simply by knowing the drop height. She decides to perform an experiment. She gathers some data, plots it, and finds the relationship.

The physicist used the camera app on her phone and simple data collection instruments available in most high school physics labs. Explain the materials she used and the steps she probably took to gather her data. **(5 pts)**

Materials used

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## Procedure

- a. Be specific / What and how much data would she collect? Inches, cm, meters? etc.
- b. Include the steps she took to ensure her data was precise.
- c. Number each step. Be NEAT **(20 pts)**

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

3. Give me a simple, understandable definition of the following scientific terms.

Independent Variable **(10 pts)**

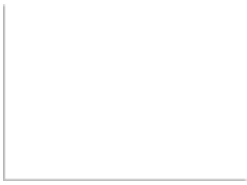
Dependent Variable **(10 pts)**

4. Which variable should be put on the x-axis? Dependent or Independent? **(10 pts)**

5. In the golf ball bounce experiment, which is the DEPENDENT variable? Why?  
Drop Height or Bounce Height **(15 pts)**

6. Plot shapes tell us what mathematical relationships exist between variables. Sketch the plot shapes of the following relationships **(20 pts) (Google This)**

a. Direct Relationship



b. Direct Square Relationship



c. inverse Relationship



d. Inverse Square Relationship

